

CHAPTER

The Market for Registered Nurses

KEY TERMS AND CONCEPTS

Hospital collusion
Nurse participation rates
Vacancy rates
Comparable worth-based wages
Derived demand for RNs
Determinants of a firm's demand for employees
Dynamic and static shortages
Federal nurse education subsidies
Monopsony in hospital markets
Wage disparity theories

Learning Objectives

Upon completing this chapter, the reader should be able to:

- Distinguish between a static and a dynamic shortage of nurses.
- Understand why a static shortage of registered nurses occurred in the period before Medicare.
- Explain the reasons for recurrent shortages of registered nurses.
- Evaluate federal policies for increasing the supply of registered nurses
- Evaluate the concept of comparable worth as a method for establishing nurses' wages.
- Discuss alternative strategies for increasing nurses' wages.

A FRAMEWORK FOR UNDERSTANDING THE PERFORMANCE OF THE MARKET FOR REGISTERED NURSES

The market for registered nurses has been characterized by recurrent shortages. During each of the shortage periods there have been calls for government intervention and for subsidies to increase the supply of RNs. Economists have been concerned with the reasons for these recurrent shortages, whether they are the result of market imperfections, and whether government intervention is required to improve market performance. Because of the concern that market imperfections have caused recurrent nurse shortages, an historical approach is used to review the market for nurses and the appropriateness of government intervention.

To understand the various claims of a nurse shortage, the different types of market imperfections, and the subsequent massive federal support for nursing education, it is useful to first examine how a competitive labor market for nurses would perform. Government intervention to increase the supply of nurses would not be justified if the RN market were functioning similar to a competitive market. Other reasons would have to be examined to explain the demand for federal subsidies to nursing education.

If, on the other hand, it is found that the market for registered nurses has not been performing efficiently, certain policy prescriptions might be called for. Depending upon the particular reasons for its poor performance, federal subsidies might be one policy alternative; other forms of government intervention might also be appropriate. Only after examining the performance of the market for nurses can it be determined whether any justification for federal subsidies to nursing education exist. Also, by examining the effect of the federal subsidies we might gain some insight as to their intended as opposed to their stated purpose.

To understand the changing demand for RNs over time, it is necessary to understand the factors that both directly and indirectly affect the demand for RNs.

The Demand For RNs

The demand for RNs is a derived demand; it is derived from the demand for the institutional settings where RNs are employed. As the demand for medical services increase as a result of the growth in private and government insurance, the aging of the population, medical advances, and so on, the demand for those institutions, such as hospitals, outpatient clinics, skilled nursing homes, and home health care where patients are treated will increase. These institutions in turn have a demand for inputs used in providing care to those patients, such as capital for buildings and equipment, as well as labor inputs, particularly nursing personnel, RNs, licensed practical nurses (LPNs), and aides.

The demand for these inputs is determined by the initial demand for each of these provider organizations, that is, the admission rate per 100,000 population and the price paid for an admission. Hospitals (which provide more intensive care for a patient than, for example, nursing homes) will use a different combination of inputs than will the nursing home. As more severely ill patients are cared for and more sophisticated technology is used in these settings, the demand for RNs relative to LPNs will increase.

The institution's demand for inputs is also affected by the relative productivity of each type of input and their relative wage. For example, as the wages of RNs increase relative to LPNs, then, other factors held constant, the organization will begin to substitute LPNs for RNs (although not one for one since the RN is more productive than the LPN). Similarly, as RNs are able to perform more complex tasks (increase their productivity relative to LPNs), the organization will substitute away from LPNs to using more RNs.

The demand for an RN education is similarly derived from the institution's demand for RNs. As the number of RNs demanded and their wage increase, the rate of return to becoming an RN increases relative to other occupations. The result will be an increase in the demand for an RN education. Non-economic factors also affect the demand for an RN education. For example, fewer discriminatory barriers enabling increased

opportunities for women in medicine and business will decrease the demand for an RN education, as would changing demographics, such as a smaller age cohort graduating from high school.

The factors affecting the demand for RNs have changed over time, which have caused changes in RN wages and employment.

A Competitive RN Labor Market

An efficiently performing market for nurses should perform as shown in Figure 16-1. Starting from an initial equilibrium point with the demand for registered nurses (RNs) represented by D_1 and supply by S_1 , the equilibrium wage would be W_1 and the number of RNs employed Q . The assumption that the demand for RNs has been increasing over time would be represented by a shift in demand to D_2 . With a greater demand for RNs, wages would be expected to increase to W_2 and the quantity of RNs employed to increase to Q_2 . The increase in RNs employed (along S_1) would come from an increase in the nurse "participation rate," which is the percent of the existing stock of RNs that are employed, as well as an increase in hours worked by currently employed RNs.¹

Thus the short-run effects of an increase in demand on the market for nurses is an increase in their wage from W_1 to W_2 , and an increase in the nurse participation rate (and hours worked) from Q_1 to Q_2 .

The long-run effect of the increase in demand from D_1 to D_2 is an increase in the stock of nurses, which is shown in Figure 16-1 by a shift to the right in the supply curve, to S_2 . The new supply curve represents a greater number of trained nurses; as the wage of RNs is increased from W_1 to W_2 nursing becomes a relatively more attractive profession when compared with, for example, teaching. Assuming that all the factors that affect the demand for a nurse's and a teacher's ed-

1. For the majority of trained nurses who are women, a number of factors influence whether or not she will seek employment. Her wage is only one such factor. Whether she has young children and her husband's income are additional factors. However, if nurses' wages increase and all other factors remain unchanged, some inactive nurses will decide to become active.

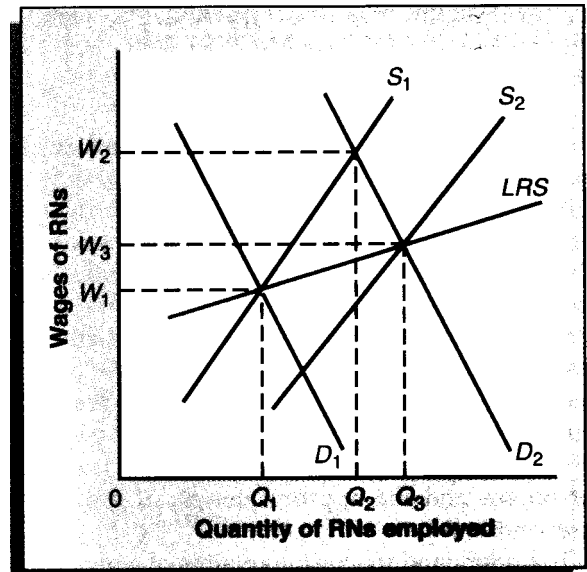


Figure 16-1. The market for registered nurses.

ucation do not change except for an increase in nurses' relative wages, some prospective teachers may instead decide to seek a nursing education. Changes in relative wages between professions do not have the same effect on all prospective students. Those who are "at the margin," i.e., perhaps prefer each profession equally, are likely to be the ones who switch careers with a change in relative incomes.

Both S_1 and S_2 are short-run supply curves for nurses; each represents the supply of nurses (hours and participation rates) for a given stock of nurses. The long-run supply curve for nurses is shown by LRS, which represents the number of persons that will become nurses over time in response to higher wages. As supply increases from S_1 to S_2 , the wage rate will fall from W_2 to W_3 . (Wages may not fall in absolute terms but decline relative to comparable professions as wages in other professions increase more rapidly.)

An efficiently performing RN market would, in the short run, have the following outcomes following an increase in demand:

- an increase in RN wages;
- an increase in the rate of return to being an RN, both in absolute terms and relative to other occupations;
- an increase in the RN participation rate, leading to an increase in the number of RNs employed; and
- an increase in the use of substitutes. As RN wages increase, RNs become more expensive relative to other types of nurses. Employers will substitute away from using RNs to greater use of other nursing personnel whose wages have not increased as rapidly.

Competitive markets, however, do not adjust immediately to an increase in demand. As observed in Figure 16-1, with an increase in demand from D_1 to D_2 , wages would rise, the number of employed nurses would increase—in the short run through an increase in their participation rate, and in the long run through an increase in the number of persons becoming nurses (a shift to the right in the supply curve). Until the market reaches equilibrium, however, a dynamic shortage might occur. As their demand for RNs increase, the major employers of nurses may not know how much they have to increase nurses' wages to bring about an increase in their employment; similarly, it takes time for working nurses to learn which hospitals are paying higher wages and for inactive nurses both to learn of the increase in wages and to decide to become active again.

A dynamic shortage for RNs is illustrated in Figure 16-2. With the increase in demand from D_1 to D_2 , the demand for RNs will initially be Q_2 , which is at the old wage W_1 on the new demand curve D_2 . Thus, in a dynamic shortage, until information becomes available to nurse employers that they have to raise wages to hire more nurses and to nurses that they could receive higher wages if they were to become active, there will be a shortage of magnitude $Q_1 - Q_2$. A shortage will be indicated by an increase in nurse vacancies which are budgeted but unfilled positions. As RN wages increase and eventually reach W_2 , the shortage will decrease, meaning that those employers who are

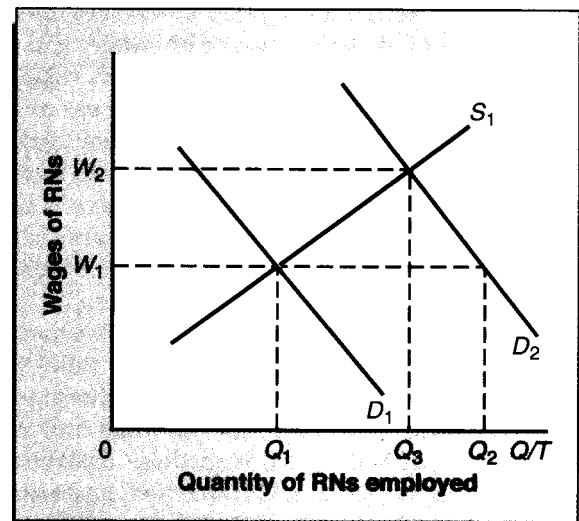


Figure 16-2. A dynamic shortage in the market for registered nurses.

willing to pay the higher price will be able to employ more nurses.

The existence of a dynamic shortage is a temporal, phenomenon and will disappear over time. Unless demand for RNs continues to increase faster than the supply of RNs, equilibrium will eventually occur.

Empirical evidence of a dynamic shortage would be nurse vacancies (generally greater than 5 percent) rising (relative) nurse wages, increased RN employment, an increase in RN participation rates, an increase in the use of substitutes. Federal subsidies to increase the supply of nurses to resolve a dynamic shortage have no economic justification.

A static shortage in which nurses' wages are prevented from reaching equilibrium is the result of interference with a competitive market. A static shortage is illustrated in Figure 16-2. With an increase in demand from D_1 to D_2 , the quantity of nurses demanded at the old wage would be Q_2 . If the wage is prevented from rising, the shortage, $Q_1 - Q_2$, will not disappear. In distinguishing between a static and a dynamic shortage

vacancy rates for nurses would be observed in both cases, however in a static shortage RN wages and participation rates will not increase. In both cases we would expect substitution away from the use of RNs to occur because it is more difficult to employ as many RNs as employers would like, in one case because nurses' wages have gone up and they have become relatively more expensive to employ (dynamic shortage), in the other because employers cannot hire all the nurses they would like at the old wage.

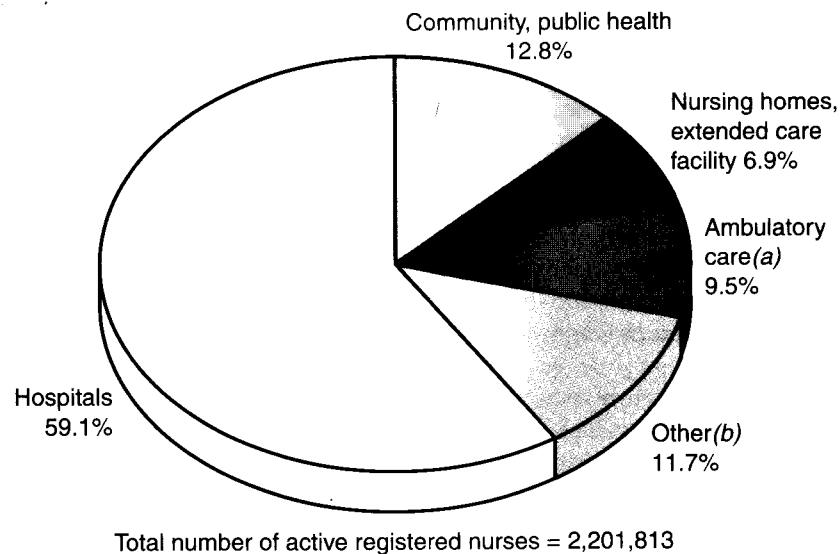
Depending upon the reason for a static shortage, government intervention is required. At times government action may have caused the shortage, as occurred during the imposition of wage and price controls from 1971 to 1974. Had these controls not been imposed, wages would have risen, and a shortage would not have occurred. The shortage ended when wage and price controls were eliminated. If the

shortage was caused by hospitals' anti-competitive behavior, then enforcement of the anti-trust laws would be appropriate. Again, federal subsidies to reduce a static shortage would not be justified. It would be more efficient (less costly) to merely eliminate the market imperfection that prevents wages from rising.

Having specified the measures of performance for determining which of the foregoing market descriptions best characterized the market for nurses, we now turn to an examination of the data.

THE PERFORMANCE OF THE MARKET FOR REGISTERED NURSES

Nurses are predominantly employed in hospitals. As shown in Figure 16-3, of the 2,201,813 registered



(a) 'Ambulatory care' includes physician or nurse solo or group practices and HMOs.

(b) 'Other' includes nursing education, student health service, occupational health, planning or licensing agency, and insurance companies.

Source: U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Professions, Division of Nursing. *The Registered Nurse Population, March 2000. Findings from the National Sample Survey of Registered Nurses*. September 2001: table 13.

Figure 16-3. Distribution of active registered nurses by place of employment, 2000.

nurses employed in 2000, 59 percent were working in hospitals. The remaining places of employment and their respective percentages were: nursing homes (6.9 percent), community or public health (12.8 percent), ambulatory care (9.5 percent), and other (11.7 percent). Thus what happens in the hospital sector has the largest effect on the employment of registered nurses.

The Market for Nurses Before Medicare and Medicaid

The demand for hospital care (hence the derived demand for RNs) has been changing over time, as described in the chapter on hospitals. Admissions and patient days in short-term general and other special hospitals (which have approximately 80 percent of all hospital admissions) had been increasing (until the early 1980s) as a result of an aging population, rising incomes and health insurance coverage, and Medicare and Medicaid, which started in 1965 and lowered the cost of hospital care to the aged and the poor. Advances in medical knowledge changed the nature of the hospital from a place that provided chronic care to an institution that provides acute care. Also, medical technology increased demands for RNs per patient day—for example, in intensive care units. Thus there was an increase in use of medical care, more of this care was provided in hospitals, and the demand for RNs increased also because of greater use of RNs in nurse staffing. An increase in the responsibilities delegated to RNs for tasks formerly performed by physicians in hospitals further increased their demand.

As a result of the above forces increasing RN demand, use of general duty nurses per patient (in non-federal hospitals) between 1949 and 1966 increased by 65 percent (1).² A dynamic shortage would have been

2. A demand function for RNs in short-term hospitals was estimated by Donald E. Yett, et al., and it was determined that the effect of a 1 percent increase in patient days would result in a 0.86 percent increase in RNs in hospitals of 200 or more beds. The effect of a 1 percent increase in RN wages would lead to a -17 percent decrease in number of RNs employed, and the cross-elasticity of demand for RNs with respect to the wages of aides was 1.43. D. Yett, L. Drabek, L. Kimball, and M. Intriligator, *A Forecasting and Policy Simulation Model of the Health Care Sector*, (Lexington, Mass.: Lexington Books, 1979), p. 95.

Table 16-1. Vacancy Rates in Hospitals for General-Duty Nurses

Year	Vacancy Rate	Year	Vacancy Rate
1953	14.6	1967	18.1
1954	13.0	1968	15.0
1956	16.8	1969	11.2
1958	13.0	1971	9.3
1962	23.0		

Sources: Reprinted by permission of the publisher, from Donald E. Yett, *An Economic Analysis of the Nurse Shortage*, (Lexington, MA: Lexington Books, D.C. Health Co., 1975); copyright 1975, D.C. Health Co., p. 138, Table 3-13.

expected to occur with such a large increase in demand for RNs. Increased nurse vacancy rates, nurses' salaries, participation rates, and substitution toward the use of non-RN nurses would have been expected. As shown in Table 16-1, nurse vacancy rates were high during the 1950s, reaching a peak of 23 percent in 1962.

Other indicators of a dynamic nursing shortage, however, provide inconsistent results. Although nurses' wages rose similar to other comparable professions over a longer time period, between 1946 and 1966 nurses' salaries increased less rapidly than other professions. After 1966, nurses' salaries increased more rapidly, with hospital RN wages increasing faster than all RN wages over the longer period.

According to Table 16-2, between 1946 and 1966 the ratio of "All RN" salaries to those of teachers was approximately equal in 1946 at 1.03, for hospital RNs it was 0.95. The comparable ratios of "All RNs and Hospital RNs" to "Female Professional, Technical, and Kindred Workers" were 1.05 and 0.97 respectively. Throughout the remainder of the 1940s, 1950s, and early 1960s, RN wages declined relative to these other occupational groups. These ratios declined to a low around 1963 where, for example, Hospital RN salaries were only 0.73 of Teachers' salaries. The same decline occurred for RNs relative to other occupations in which women were predominantly employed.

After Medicare and Medicaid were enacted, RN salaries increased faster than those of Teachers or other female occupations. By 1972, RN wages, particularly Hospital RNs, once again exceeded those of other female occupations, rising to 1.10 and 1.08 for

Table 16-2. Ratio of all Registered Nurses' and Hospital General-Duty Registered Nurses' Salaries to Those of Teachers and Female Professional, Technical, and Kindred Workers

Year	Female Professional, Technical, and Kindred Workers		Teachers	
	All RNs	Hospital RNs	All RNs	Hospital RNs
1946	1.05	0.97	1.03	0.95
1948	1.00	0.95	0.92	0.87
1951	0.97	0.92	0.86	0.82
1954	0.89	0.82	0.82	0.76
1957	0.91	0.85	0.79	0.74
1961	0.86	0.79	0.77	0.70
1963	0.90	0.87	0.75	0.73
1966	0.93	0.87	0.79	0.73
1969	1.02	0.95	0.87	0.81
1972	1.10	1.08	0.97	0.96
1975	1.08	1.08	0.96	0.96

Source: Donald E. Yett, *An Economic Analysis of the Nurse Shortage*, (Lexington, MA: Lexington Books, 1975).

All RNs and for Hospital RNs. With respect to Teachers, the Hospital RN ratio was similar to what had existed in the 1940s.

Based on the above data on relative wages, it would appear that there was a relative *surplus* rather than a relative shortage of nurses before 1966. An RN surplus would be characterized by RN supply increasing faster than demand for RNs, leading to falling relative wages (RNs to other female workers) and a declining relative rate of return to a nursing career. Comparing data on relative rates of return to a nursing education to "females with 1 to 3 years of college training" again appear to indicate that RNs were in surplus. From 1946, the relative rate of return to nursing declined, reaching a low in 1961, indicating women could receive a higher rate of return by entering an occupation other than nursing. By the late 1960s and early 1970s, however, the relative rate of return to nursing had increased.

Of interest is that in the period before 1966, nurse wage increases were not uniform according to place of nurse employment. Wages (nominal) increased much more rapidly between 1946 and 1966 for nurse education (224 percent) and school nurses (215 percent) than for hospital-employed nurses (157 per-

cent). After 1966, the opposite occurred as hospital nurses experienced the largest percent increase in their wages.

Consistent with these RN wage increases by place of employment, the number of nurses employed in nonfederal hospitals increased by 109 percent between 1949 and 1966. However, the increase in the number of nurses employed in nurse education positions and in other areas that had larger percent wage increases was much greater, 254 percent.

Relatively large increases in nurses' wages in non-hospital markets led to correspondingly large increases in nurse supply. The percent increase in nurse employment was greater in the non-hospital sector which, at that time, employed only 23 percent of **all** nurses. Surprisingly, if there were no barriers to RNs moving between the hospital and non-hospital sectors and if the training costs were similar, one would expect wage increases to be similar in both sectors, yet nurses in the non-hospital sectors received higher wage increases.

Although the relative salary differential of RNs to other nurses (i.e., LPNs and aides) changed very little (until the mid 1980s), a great deal of substitution occurred (as shown in Table 16-3). From 1949 to 1966,

the ratio of RNs to LPNs decreased, from 6.25 in 1949 to 2.22 in 1966. Substitution would be expected if salary differentials increased or if there was a change in relative productivity (changes in productivity should be reflected in changes in relative salaries). There was, however, virtually no change in their relative salaries over this period. The downward trend in the use of RNs relative to LPNs began to reverse itself beginning in the early 1970s with the use of RNs relative to LPNs increasing from 1.96 in 1970 to 2.70 in 1980 to 4.8 in 1990 and to 7.7 by 2000. (The decline in the use of LPNs continued into the 1990s even though their wages relative to RNs also declined; this change in staffing pattern is discussed later.)

Based on the above data, what can one conclude about how well the market for RNs was performing? Beginning in the late 1940s, the base period for comparison with changes over time and with other occupations, nursing appeared to be a relatively attractive profession from a financial standpoint. Its rate of return was slightly higher than comparable professions. From that base period to the mid 1960s, however, the relative financial attractiveness of a nursing career declined. With a smaller increase in wages and a decline in relative rates of return, fewer persons would be expected to enter nursing. This data would be more in-

dicative of an RN surplus (i.e., demand increasing less rapidly than supply, resulting in a decline in the relative wage of nurses) rather than a shortage.

The common belief during this period, however, was that there was an RN shortage; practical nurses were being substituted for RNs, and RN vacancy rates in hospitals were increasing. Contrary to a shortage, however, RN wages (and their rates of return) were not rising relative to comparable professions or to practical nurses.

Throughout this period, hospital associations complained about the shortage of registered nurses. The evidence used to support such claims was data on vacancy statistics of unfilled nursing positions in hospitals and studies using the ratio of registered nurses to the population. For example, in 1956, it was estimated that there was a shortage of 70,000 nurses in the United States and (in 1963) that by 1970 the magnitude of the shortage would reach 200,000 nurses. Vacancy rates increased from between 13 and 16 percent in the mid 1950s to 23 percent by 1962.

As a result of these claims of a shortage of RNs, the U.S. Congress in 1964 passed the Nurse Training Act (NTA) which provided \$300 million over a 5-year period to alleviate the alleged shortage. (The NTA was subsequently renewed and amended many times. Periodic concerns of RN shortages led to almost \$3 billion being authorized by the U.S. government to alleviate various nurse shortages.)

A static shortage was the only type of market situation that logically incorporated the contradictory data of falling relative RN wages and increasing vacancy rates. The nurses' market was essentially in equilibrium during the period 1946 to 1949, as shown by the intersection of the demand and supply curves D_1 and S , in Figure 16-2. As the demand for hospital care increased bringing with it an increased demand for RNs, the demand curve shifted to D_2 . If hospital RN wages were kept below the new equilibrium wage, Q_1-Q_2 would represent the size of the shortage (i.e., vacancies in hospitals). Hospitals would have had to substitute toward greater use of practical nurses because they could not employ all the RNs they wanted at the RNs' wage. Similarly, hospital RNs' wages, relative to those of RNs in other nursing employment, would increase less rapidly if wages were held down in the hospital

Table 16-3. Ratio of RNs to LPNs in Nonfederal Short-Term General and Other Special Hospitals

Year	Employment	Year	Employment
1949	6.25		
1955	3.45	1975	2.17
1959	2.70	1980	2.70
1960		1985	3.70
1962	2.50	1990	4.76
1963		1995	6.20
1966	2.22	2000	7.70
1968	2.00		
1969			
1970	1.96		
1972	2.00		

Source: 1949–1978: U.S. Department of Health and Human Public Health Services, Health Resources Administration, *The Recurrent Shortage of Registered Nurses: A New Look at the Issues*, DHHS Publication (HRS), pp. 3 and 6. Years 1980–2000: derived from data in American Hospital Association, *Hospital Statistics*, (Chicago: AHA), various editions.

sector but not in other nurse employment sectors. As hospital RN wages were prevented from increasing, RN wages and relative rates of return fell behind those in comparable occupations.

A static shortage where RN wages increased in an absolute amount but fell relative to non-hospital employed RNs and comparable professions also explains why hospital nurse employment increased less than in the non-hospital sector.

Given that the data appears consistent with a static shortage in the hospital market prior to Medicare, it is necessary to explain how such a static shortage could have persisted. Namely, what mechanism would have prevented nurses' wages from reaching the equilibrium level, and second, why did the static shortage disappear in the period after 1966?

Hospital Market Power in the RN Labor Market

Prior to 1966, hospitals acted as a cartel in setting RN wages. By acting collusively, hospitals set RN wages below the equilibrium level thereby creating a static shortage. At that time, hospitals employed 75 percent of all RNs (both hospital based and private duty nurses). With relatively few hospitals in an area, it was relatively easy for them to collude in setting RN wages and to monitor whether each hospital was adhering to the agreement.

When there are many small firms in a competitive industry, it is both difficult to organize a cartel and, if successful, for the cartel to monitor firms to ensure that they do not violate the collective agreement. It is in each firm's interest to cheat because they can attract nurses from other hospitals by slightly raising their RN wages. Hospitals, however, can quickly find out whether or not another hospital in the area has changed its wage policy. Also, because hospitals employ almost all of the active nurses, it is difficult to attract nurses from other, non-hospital firms.

Hospitals decided to hold down nurses' wages because they believed that the short-run supply of nurses was relatively inelastic (i.e., increasing the wage would result in small, if any, increases in the number of nurses seeking work, either through a change in their status from inactive to active or from in-migration from other areas). RN wages also represented a significant portion of a hospital's budget; in-

creasing the wage rate to attract new nurses would have required an increase in the wage paid to all existing RNs as well.

To test the hypothesis of hospital collusion in setting RN wages, Donald Yett conducted a survey of the thirty-one largest hospital associations to determine whether or not they had wage stabilization programs. Fourteen of the fifteen hospital associations that responded reported that they did have such programs. (The one hospital association that did not asked how it could start one.) Additional evidence of the attempt by hospitals to fix nurses' wages in their area is the following statement that appeared in the *Los Angeles Times*: "The majority of hospitals fix wages for nurses on recommendations from the Hospital Council of Southern California. The Council's recommendations have always been accepted and are based on recommendations from the management consulting firm of Griffenhagen-Kroeger Inc." (4).

As hospitals found it difficult to hire more nurses during the pre-1966 period and vacancy rates continued to increase, they began recruiting foreign-trained nurses and lobbied for federal legislation to subsidize an increase in the number of registered nurses.

The Market for RNs in the Post-Medicare Period

After the passage of Medicare and Medicaid, the market for RNs changed. The demand for hospital care increased as the aged and the poor were provided with hospital coverage. At the same time, hospitals were reimbursed on a "cost-plus" basis (in addition to their costs of caring for an aged person, hospitals received 2 percent for growth and development). Hospitals increased their demand for RNs and because the hospital's costs of more RNs and higher RN wages could be passed on to the government, their demand became inelastic with respect to the RNs' wage.³

3. During the 1960s, hospitals did not have good accounting systems. Thus to calculate their payment from the government for caring for Medicare patients, the hospital's total charges were divided by the proportion of charges to Medicare patients. That ratio was then assumed to equal the proportion of costs of caring for Medicare patients, hence the phrase, "ratio of charges to charges for cost." Depending upon what portion of their hospitalized population was covered under some form of cost reimbursement (e.g. government, Blue Cross, or other third-party reimbursement), hospitals were relieved from pressures to contain their costs.

Wage increases to hospital-employed nurses increased rapidly in the post-Medicare period, more rapidly than wage increases to non-hospital-employed nurses and to persons working in non-health occupations with comparable training. Hospital RN wages, which had been held down for a number of years, were allowed to rise. Thus by 1969, rates of return to hospital-employed RNs were comparable to other occupations.

To sum up, hospitals were no longer inclined to act collusively in holding down RN wages after 1966 because Medicare and Medicaid reimbursed hospitals for the costs of caring for the aged and poor, regardless of the cost of that care. RN wages consequently increased at a rapid rate and, as a result, RN participation rates rose, hospitals were able to hire more nurses, and the vacancy rate decreased; by 1971 the vacancy rate dropped to 9.3 percent from its high of 23 percent in 1962.

The static shortage of RNs before 1966 was caused by hospital collusion to keep RN wages from rising. The appropriate public policy would have been enforcement of the anti-trust laws against anti-competitive behavior to allow RN wages to rise, which would have increased hospital costs—a normal occurrence in an industry experiencing a rising demand for its services and facing a rising supply curve for its factor inputs. Claims of a "shortage" in this type of situation are merely a matter of employers not wishing to pay higher prices for their inputs. Allowing nurses' wages to rise would have brought forth an increase both in the stock of nurses and in their participation rate. Federal legislation to increase the supply of nurses was not necessary.

The Market for RNs in More Recent Years

As RN wages increased in the mid to late 1960s, vacancy rates declined, nurse participation rates increased, and nursing school enrollments increased. There is always a time lag as prospective students learn of the nursing profession's changing prospects and adjust their career plans. Enrollments were sharply increasing by the early 1970s, resulting in large increases in the supply of RNs (see Figure 16-4). There no longer appeared to be concern with a nurse shortage. In 1975, President Ford vetoed Congressional renewal of fed-

eral funding for nurse education (but Congress overrode the veto).

The basis for another nurse shortage, however, began in 1971 when President Nixon imposed wage and price controls on the economy. Although these controls were removed from all other industries in 1972, they remained in effect for health care until 1974. The effect of these wage controls, together with the increased supply of RNs, began to have its effect by the late 1970s. Demand for RNs continued to grow throughout the 1970s, however, the wage controls led to lower relative wages for RNs. The government created a static shortage. By the late 1970s nursing school enrollments began to decline, and vacancy rates reached 14 percent by 1979.

The 1979 to 1980 shortage was short lived. As shown in Figure 16-5, RN wages sharply increased at the same time the economy entered a severe recession in the early 1980s. The rising national unemployment rate caused more nurses to seek employment and to increase their hours of work. Since 70 percent of RNs are married, the loss of a job by a spouse or even the fear of losing a job—is likely to cause RNs to increase their labor force participation rate to maintain their family income. Rising wages and the rising unemployment rate increased nurse participation rates from 76 percent in 1980 to 79 percent by 1984. As a consequence of these forces, nurse vacancy rates declined to a low of 4.4 percent by 1983, indicating that was no longer a shortage.

The (dynamic) nursing shortage of the late 1970s was once again resolved through a combination of rising wages, an increase in the nurse participation rate, and a high national unemployment rate (2).

As nurse wages remained stable (and actually declined in real dollars) between 1983 and 1985 and the vacancy rate declined, nursing school enrollments began a sharp decline through the late 1980s.

Starting in the mid 1980s, the market for hospital services underwent dramatic changes that affected the market for nurses. The trend by Medicare, private insurers, and HMOs to reduce the use of the hospital led to shorter hospital lengths of stay. Patients required more intensive treatment for the shorter time they were in the hospital. Hospitalized patients were more severely ill, a greater number of transplants were being performed, and there was an increase in the number of

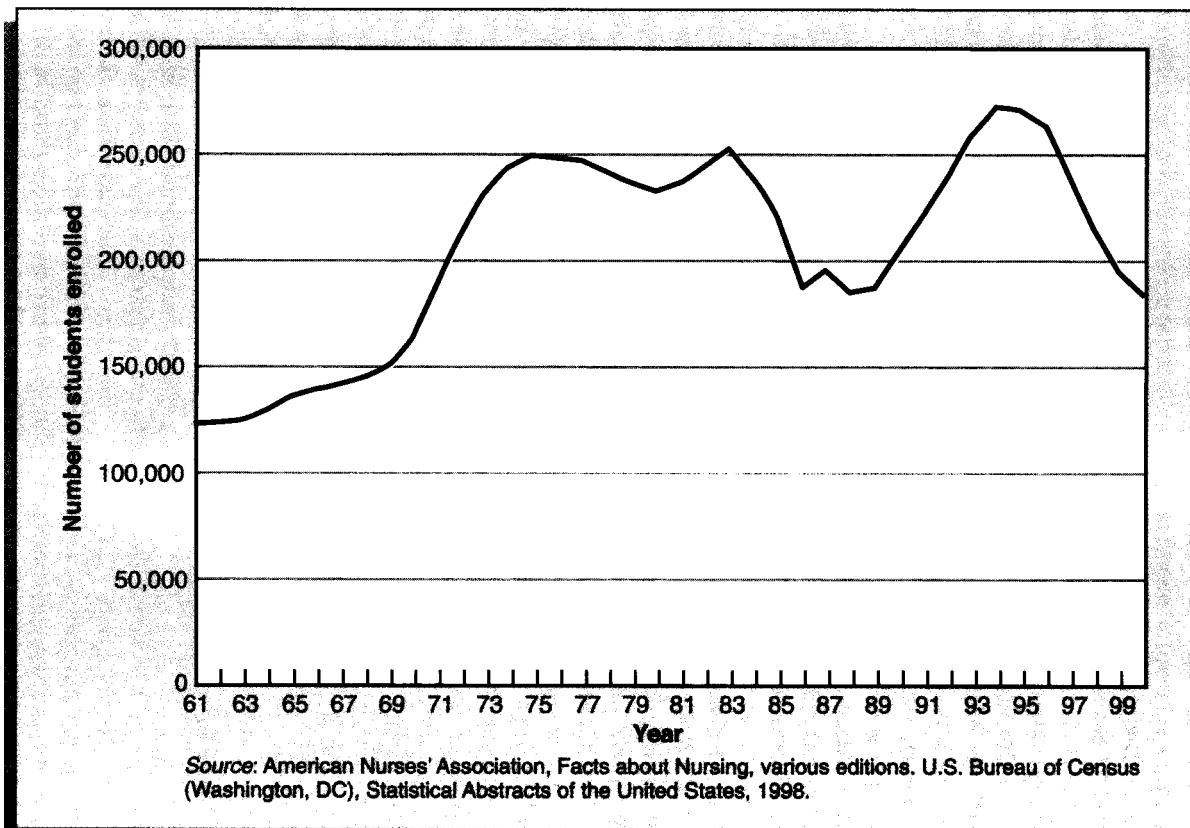


Figure 16-4. Nursing school enrollments, 1961-1999.

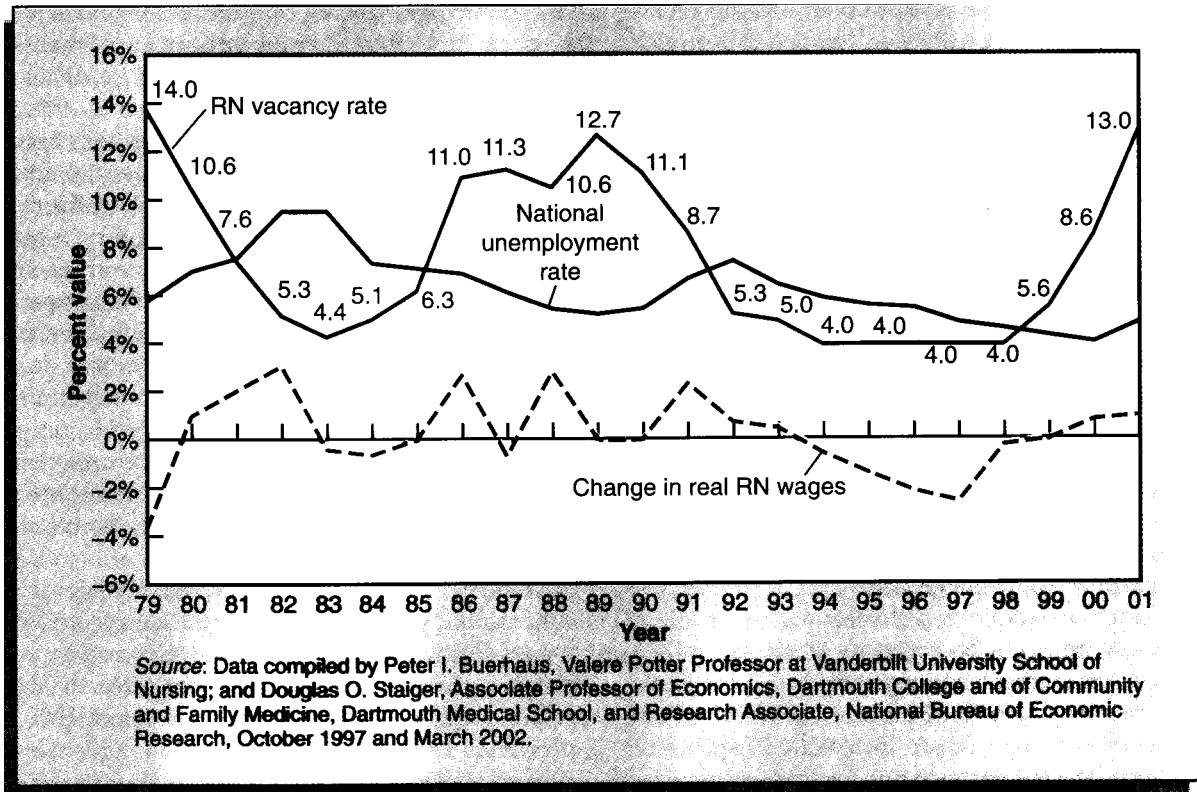


Figure 16-5. RN vacancy rates, annual percent changes in real RN wages, and the national unemployment rate, 1979-2001.

low birthweight babies. (The Medicare patient case-mix index for all hospitals increased from 1.17 in 1985 to 1.39 by 1992.) The recovery period, which requires less intensive care, was occurring outside the hospital. As a result, hospitals began to use a greater number of RNs per patient. The greater demand by hospitals for RNs during this period is indicated by the following: in 1975 there were 0.65 RNs per patient, it increased to 0.88 by 1980, to 1.31 by 1990, to 1.63 by 1995, and to 1.98 in 2000. The percent increase in RNs per patient exceeded the decline in patient days.

There was also an increase in the demand for nurses in outpatient and non-hospital settings. As the use of the hospital declined, use of outpatient care, nursing homes, home care, and hospices for termi-

nally ill Medicare patients increased. Between 1980, 1991, and 1999, outpatient visits (ambulatory care visits to physicians' offices, hospital outpatient, and emergency departments) increased from 262 million to 400 million to 944 million. Use by Medicare patients of skilled nursing homes increased from 8.645 million days in 1980 to 24.126 million in 1991 to 50.1 million days in 1999. Home health visits increased sharply from 22.4 million in 1980 to 78 million in 1991 to 258 million in 1997 (then declining to 113 million in 1999), and hospice admissions increased from 2,200 (in 1984 when it became a Medicare benefit) to 112,595 in 1991 to 700,000 by 2000 (3). In addition to providing care in these alternative settings, there was an increased demand for registered nurses by cost-

containment companies to conduct utilization review and case management.

As the demand for nurses in all these different settings increased faster than supply in the mid to late 1980s, nurses' wages were slow to respond, nursing school enrollments had been falling, and the national unemployment rate declined as the economy began improving. As a consequence, vacancy rates once again began to rise, going from 5.1 percent in 1984 to 12.7 percent in 1989. By the late 1980s there was again concern over a shortage of nurses.

Hospitals again lobbied Congress for subsidies to increase nurse education and for an easing of immigration rules on foreign-trained nurses. The nursing shortage of the late 1980s resulted in Congress enacting the Nurse Shortage Reduction Act (1988) and the Immigration Nurse Relief Act (1989), which made it easier for foreign nurses to receive a working visa.

Neither of the above legislative acts, however, was needed since economic incentives once again eliminated the shortage. As the economy weakened in 1990 and the unemployment rate began to rise, nurse participation rates increased to 82 percent by 1992. Nursing school enrollment had begun increasing 2 years after nurse wages and the vacancy rate began their increase. With the increase in supply of new nurses and the higher participation rate, vacancy rates declined to 4 percent by 1994. The nursing shortage ended.

As the nurse shortage was over by the mid 1990s, one could have forecast that another shortage would occur by the end of the decade. As shown in Figure 16-5, starting in 1994, nurses' real wages (adjusted for inflation) declined and were negative for 4 years. It was during this time that hospitals were trying to reduce their costs to be price competitive so as to be included in managed care's provider networks. It was not until recently that nurse wage increases finally increased faster than inflation.

The national unemployment rate also declined throughout the late 1990s since the U.S. economy was doing very well. Nursing school enrollments typically decline several years after a decline in wages and vacancy rates. As shown in Figure 16-4, nursing school enrollments peaked at 270,000 in 1993 and then declined for the remainder of the 1990s. The reduction

in nurse wages during the mid to late 1990s led to a large reduction in nursing school enrollments and, consequently, in the number of nurse graduates.

In addition to declining enrollments, there was concern that the population of nurses was aging (4). In 1980, 25 percent of RNs were under the age of 30 compared to only 9 percent in 2000. And the number between 35 to 54 years of age increased by more than 50 percent between 1980 to 2000. The average age of a nurse was 37.9 in 1980, 42.4 in 2000, and is expected to be 45.4 in 2010. As the nurse population ages, participation rates decrease as does the number of hours worked. (The nurse participation rate began to show a slight decline in the late 1990s.)

Within a few years, one would have expected to observe newspapers writing articles about the shortage of nurses and of hospitals paying bonuses to attract nurses (5).

As expected, the years of declining real nurse wages, falling nursing school enrollments, and the aging of the nurse population led to another nursing shortage. After years of low vacancy rates, the vacancy rate began increasing from 4.0 percent in 1998 to 5.6 percent in 1999, and quickly rose to 13 percent by 2001.

And, as expected each time there is a new nursing shortage, various bills have been introduced in the Congress that attempt to address different aspects of the nursing shortage.

Of serious concern to hospitals, who already have great difficulty in filling nurse vacancies, is legislation recently enacted in California supported by the California Nurses Association that sets minimum nurse-to-patient staffing ratios. These mandated ratios, which vary by hospital department, are higher than current staffing levels. The proponents of mandated minimum ratios claim that RN staffing had fallen behind the needs of the increasing severity of hospitalized patients, and higher RN ratios will increase patient safety and quality of care.

Minimum staffing ratios were mandated in California without any conclusive empirical evidence as to which RN ratios, either by type of nursing unit or type of patient, produces the best outcomes (6).

Other states are waiting to see how the new staffing ratio law works before deciding to imitate California.

While it is uncertain as to what staffing ratio in different hospital departments would produce an increase in patient outcomes, it is clear that an increase in staffing ratios will increase hospital costs. These increased costs will be passed on in the form of higher health insurance premiums, which will increase the number of uninsured since their insurance becomes too expensive. It is unfortunate that the new California law does not require a monitoring system to determine whether the higher ratios improve patient care and, if so, by how much.

Since the end of government wage and price controls in the mid 1970s, the recurrent shortages of RNs were caused by increased demands for RNs and hospitals' failure to immediately recognize that, at the higher demand, nurse wages must be increased. Once hospitals realized that the market for RNs has changed, the adjustment process to eliminate that shortage begins, namely, increased RN wages. The disequilibrium in RN labor markets is the result of dynamic rather than static shortages. With higher wages, the supply of RNs increased, by increases in nurse participation rates and, over time, through increased nursing school enrollments. These recurrent shortages were resolved through the workings of the market; federal subsidies to support nurse education were unnecessary. The most appropriate response to recurring dynamic nurse shortages is to facilitate the market's adjustment process. Better information to hospitals and to prospective nursing students about nurse labor market conditions would improve performance of both the RN labor market and the education market and dampen the severity of the recurrent RN shortages.

The current nurse shortage, however, may take longer than usual before equilibrium is once again achieved because of both the aging of the nurse population and the legislated higher nurse staffing ratios.

THE REGISTERED NURSE EDUCATION MARKET

The number of RN graduates plus immigration of foreign trained RNs less retirement of RNs from the labor force determine changes in the long-run supply of nurses. The nurse education sector is the most important determinant of the future stock of RNs and has

been the recipient of large federal subsidies. Thus, a better understanding of the responsiveness of nurse enrollment to economic incentives can clarify both the effectiveness of federal subsidies to increase the number of RNs as well as the role of nurse enrollment in exacerbating as well as alleviating recurrent dynamic shortages.

Nursing education is typically provided in one of three types of settings: 3-year diploma schools associated with hospitals, community colleges offering a 2-year associate degree, and 4-year colleges offering a baccalaureate (B.S.) degree.⁴ While attending classes, students in diploma schools worked in hospitals and received a stipend. Hospitals subsidized the cost of their diploma schools to assure themselves a supply of nurses upon graduation. However, as the mobility of nurses increased, hospital diploma schools became a diminishing source of nurses for the particular hospital subsidizing them. Hospitals were no longer assured that their subsidies to such schools would be repaid when the nurses left to work elsewhere. As tuition costs to the students in diploma schools rose, enrollments declined.

After World War II, diploma schools of nursing declined rapidly. In 1950, there were 1,314 state-approved schools of nursing. Of these, 1,118 were diploma schools, 195 were B.S. programs, and 1 was an associate program. By 1966 there were 1,266 programs; of these, 788 were diploma schools, 280 were B.S. schools, and 198 were associate degree schools. By 2002, the total number of programs increased to 1,462; of these, only 89 were diploma schools, 587 were B.S. schools, and 786 were associate degree schools (7).

Although the number of diploma school programs declined, graduates from these programs still made the largest contribution to the number of new active nurses until 1972. Since 1972, more nurses have graduated from associate degree programs; these graduates

4. Of the approximately 2.2 million employed RNs in 2000, 26 percent graduated from diploma nursing schools, 43 percent from associate degree programs, 25 percent graduated from a 4-year baccalaureate degree program; and 6 percent graduated from masters and doctorate programs.

represented 3 percent of graduates in 1960, 9.6 percent in 1965, 31 percent by 1970, and 60 percent in 2000. The large growth in associate degree programs began before federal subsidies for nurse education became available. The percent of graduates from each of these programs is shown in Figure 16-6.

To understand the probable intent of federal subsidies to support nurse training and how effective it was in achieving its stated goals of increasing the supply of RNs, it is worthwhile to examine the original Nurse Training Act.

The stimulus for the Nurse Training Act of 1964 was the 1963 report by the Surgeon General's Consultant Group on Nursing, appointed in 1961, that there was a serious shortage of nurses. Evidence for the shortage was the very high nurse vacancy rate in the early 1960s (see Table 16-1) and an estimate of the number of RNs needed based on the ratio technique (thus unrelated to any economic definition of shortage). The forecast of a shortage was also unrelated to any analysis of the performance of the nurse labor market.

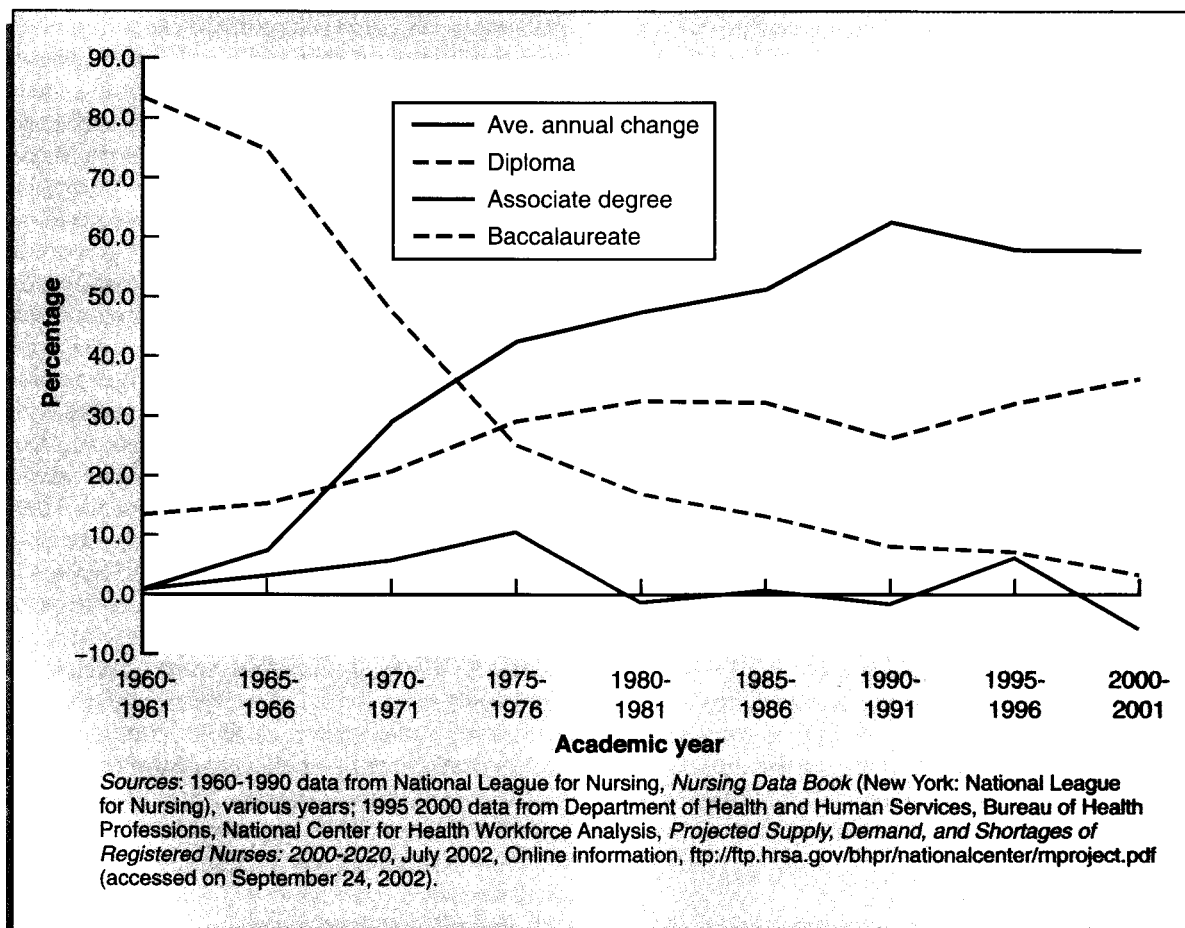


Figure 16-6. Percent distribution of nursing graduates by type of nursing school program and average annual change in total graduates, 1960-2001.

Support for federal legislation to subsidize nurse training came from several groups: Congress recognized the potential political rewards of backing health legislation; the federal bureaucracy—specifically, the Division of Nursing in the U.S. Public Health Service—helped to justify the need for the legislation with an eye toward an expanded role in administering it; hospitals favored it because they wanted an increased supply of nurses, thereby slowing down the rate of increase in nurses' wages. Hospitals wanted the federal subsidies to be used to increase the number of nurses graduating from diploma schools of nursing. Sufficient capacity existed in those schools to accommodate increases in enrollment.

The American Nurses Association (ANA) also favored the legislation, but with different expectations than hospitals as to its effects. As a professional association, an important goal of the ANA is to increase its members' incomes. If the legislation were to have the effect desired by hospitals, namely an increase in the supply of nurses, then the subsidy would limit the rise in nurses' wages, which would be contrary to the ANA's objective. Instead, the ANA envisaged the educational subsidies as an opportunity to change the role of registered nurses. Nursing leaders saw the transfer of nursing education from non-college settings into universities as important to the advancement of nursing as a profession (recognizing that economic advancement would follow). The ANA wanted the educational subsidies to be redirected toward producing fewer but more highly trained nurses who could increase their productivity by undertaking additional responsibilities. The effect of fewer nurses with more training would be an increase in nurses' wages.

From the ANA's perspective, unless B.S. graduates were subsidized, fewer prospective nurses would choose a 4-year school. A graduate from a baccalaureate school spends more time in school compared with graduates from associate degree or diploma schools, yet the wage differential does not compensate baccalaureate graduates for the additional training time or forgone income. Studies confirm that the rate of return to the nurse with a baccalaureate degree working

in a hospital setting is less than for a nurse with only a 2-year associate degree (8).⁵

The growth in demand for associate degree education was related to its relatively high rate of return compared with comparable occupations. Associate degree programs would have grown without federal subsidies.

Thus the reasons for federal nurse education subsidies varied. Hospitals wanted cheaper inputs, and the ANA wanted to change educational requirements and graduate fewer nurses capable of performing more tasks. Neither outcome would have improved the functioning of the market for nurses, consequently there was no economic justification for the federal legislation.

By analyzing its implementation and its effects, it becomes possible to evaluate the legislation.

The two broad purposes stated in the Nurse Training Act (NTA) of 1964 were: to increase the quantity of nurses and to improve their quality, matched the separate interests of the ANA and AHA. To achieve these goals, the two most important areas for federal funding (receiving over 90 percent of the total funds expended on nurse training and which were continued in subsequent renewals to that legislation) were grants to schools of nursing for distribution in the form of scholarships and loans to students and grants to the nursing schools for construction, planning, or initiating programs of nursing education, or for general financial support.

Numerically, the legislation was to increase the number of nursing school graduates to 53,000 a year by 1969, a 75 percent increase over 1961. However, the

5. To further make the B.A. degree a more attractive option to prospective nurses, the ANA has proposed a two-tier licensure system, one for graduates with a B.A. degree and the other for associate and diploma school graduates. Nurses graduating from two-year programs would only receive a technical nursing license. If the ANA were successful in changing state educational requirements for nurses in this manner, there would be a sharp reduction in the number of new graduates each year. Currently, graduates with a B.S. degree represent only 32 percent of new nurse graduates; thus this policy would result in a loss of two-thirds of nursing graduates.

number of graduates produced by schools of nursing in 1969 was only 1,196 more graduates than what the government estimated would have been the case without any federal legislation.

In administering the NTA, no attempt was made to maximize the number of nurse graduates. If that had been the goal, the funds would have been allocated differently according to the types of nursing schools. Instead, there appears to have been a conscious decision to favor growth in the number of nursing graduates from baccalaureate degree programs, which coincided with the ANA's goals. The National League for Nursing (NLN) was designated as the accrediting agency for dispensing federal support to schools of nursing; its goals were, of course, similar to those of the ANA. Until 1968, payment to diploma and associate degree schools under the NTA received much fewer funds than what Congress authorized, while payments to baccalaureate programs were approximately equal to what was authorized.

Although federal funding of nursing schools and students did not achieve the increase in graduates its proponents claimed would occur, a large increase in the number of employed nurses did occur. An increase in the number of RNs employed can occur in one of three ways: (a) an increase in the number of nursing graduates, (b) an increase in the nurse participation rate, and (c) an increase in immigration of foreign-trained nurses. The federal program was directed exclusively at increasing the number of nursing graduates.

Using an econometric model to simulate the nursing market over time, the authors concluded that the achievement of the increase in number of RNs was primarily the result of increased nurse participation rates rather than the federal subsidy program, which resulted in a very small increase in graduates compared to what would have otherwise occurred (9).

Paradoxically, the more successful the federal government is in increasing the number of nursing graduates, the lower will be the increase in nurses' wages. An increased supply of new nurses would hold down potential increases in nurses' wages; this dampening effect would have an adverse impact upon the participation rate (10). Thus the subsidy to nursing schools could well have been self-defeating!

Important to the discussion of federal subsidies for nurse education is whether the nurse education market responds to changes in the demand for RNs. If the education market is responsive to changes in the RN labor market, then again there is little justification for federal subsidies. As shown in Figure 16-4, over the period 1961 to 2000, nursing enrollments have, at different times, sharply increased and decreased. While the size of the age cohort is an important factor influencing nurse enrollments, other factors also influence the attractiveness of a nursing career, such as changing career opportunities for women. However, a number of prospective students who are undecided between different career options will be influenced by the financial attractiveness of a nursing career.

There is a relatively close relationship between changes in nurse enrollments with changes in RN (real) wages, shown in Figure 16-5. As discussed previously, RN wages increased rapidly in the period after Medicare and Medicaid were enacted in the mid 1960s. Accordingly, nurse enrollments sharply increased several years afterward. Nurse enrollments were constant during the period in the early to mid 1970s when wage and price controls were imposed on hospitals, and hospitals could not increase nurse wages; consequently, a nursing shortage occurred, and the vacancy rate rose. Nurse enrollments thus declined from the end of the 1970s through the 1980s.

RN wages increased in the early 1980s and increased, on average, through the 1980s (Figure 16-5), however, it was not until the end of the 1980s before nurse enrollments increased. During the time nurse enrollments were increasing in the early 1990s, RN wages were declining. After several years of declining wages, nurse enrollments once again fell.

There is a time lag between changes in the financial attractiveness of a nursing career and prospective students' decision to enroll in a nursing school. It is likely that current decline in nurse enrollments will not reverse its trend until several years after the long decline in nurse wages during the 1990s have risen.

Proposals for continued federal subsidies to increase the supply of nurses ignore the important role played by higher wages in increasing both the short-

and long-run supply of nurses. In contrast to the time required for federal subsidies to have their impact on increasing the supply of nurses, the adjustment process by existing and prospective nurses to increased wages has been relatively quick.

AN ECONOMIC ANALYSIS OF COMPARABLE WORTH

Nurse Associations have made numerous proposals affecting either the demand for RNs or the supply of RNs whose intended outcome would be an increase in RN wages. Examples of demand-increasing programs are to legally permit RNs to perform more highly valued tasks, thereby increasing their productivity and second, mandating minimum RN staffing ratios in hospitals (minimum ratios that are higher than existing ratios). Supply-side examples have been limits on immigration of foreign-trained RNs and the American Nurses' Association's efforts to change state licensure requirements for becoming a nurse, requiring a professional nurse receive a B.S. degree. The following section discusses an additional proposal for increasing RN wages, using the concept of comparable worth to calculate nurse wages. The effect of these policies is to increase RN salaries, while their higher costs would, in part, be shifted to patients, government, and other third-party payers.

Nursing associations, whose members are predominately female, have been in the forefront of the movement to legislate "comparable worth" since it was seen as a way to raise nurses' wages. Although these political efforts have not been successful to date, it is instructive to examine this concept since it clarifies the determination of wages in a market system. The crux of the debate regarding comparable worth is over the appropriate mechanism for setting wages.

According to the 1964 Civil Rights Act, a person must receive equal pay for performing equal work; discrimination in employment is illegal. Comparable worth goes beyond that concept; its proponents want *equal pay for work of comparable value*. Two people performing different jobs should receive the same pay if

a government agency determines that their work is of equal value. The proponents of comparable worth base their argument on the empirical observation that certain jobs that are filled predominately by women are paid less than jobs that are filled predominately by men. Accordingly, the value of each job should be determined not by the marketplace, but by fact-finding commissions.

Comparable worth is analyzed by first reviewing how wages are determined in a competitive market and, second, the effects on wages and employment of noncompetitive restrictions. Two alternative theories are then used to explain observed wage disparities between males and females. Next, the consequences of using comparable worth to achieve pay equity are discussed, and finally, alternative strategies to increase nursing salaries are presented.

The Determination of Wages in Competitive Markets

In a competitive market, wages are determined by the interaction of the firm's demand for employees and by the supply of those employees. The wage is the equilibrating mechanism; it is the price of labor. At higher or lower wages, the firm would be willing to hire fewer or more persons, respectively. Also, the higher the wage or income, the greater are the number of people willing to enter that occupation or profession. (A change in the wage represents a movement along the firm's demand curve and a movement along the supply of labor curve.)

The firm's demand for labor is also determined by the value of an employee's output which consists of two parts: the productivity of the employee (i.e., how much output each additional worker can produce), and the price at which that output can be sold in the marketplace. (Changes in either employee productivity or the price of the output cause *shifts* in the demand for labor.) Employee productivity is affected by education/training, skill, experience, and the amount of invested capital or equipment per employee. Thus, even within a given profession, differences in income exist because of differences in productivity. The higher the price at which the output can be sold, the

greater is the market value of the employee producing that output. For example, if a nurse practitioner is reimbursed for performing a physical exam at a lower fee than a family practitioner, the value of the output produced by the nurse practitioner is lower.

In a competitive market, therefore, a person's income depends on three factors: their productivity, the price at which that service is sold in the market, and the number (supply) of people in the profession.

Market restrictions may either increase or decrease employees' incomes. Limiting entry into the profession will increase the incomes of those in the profession while shifting supply into those occupations without entry barriers, thereby decreasing their incomes. Entry barriers are either sanctioned by the government (as occurs with licensing) or by non-government groups such as unions when limits are placed on the number of unionized plumbers. The effect of these entry restrictions is to have a smaller supply of professionals in the restricted market and a larger supply in the unrestricted market, causing a wage differential between the two markets.

Restrictions on the tasks that health professionals may perform have similar effects. A health professional is often capable of performing certain tasks (either by experience or training) but is prohibited from doing so by state practice acts. Prohibiting a professional from performing highly remunerative tasks reduces the economic value of their output (the demand for their services is shifted to the left).

When hospitals colluded in setting nurses' wages (as apparently occurred in the 1950s and early 1960s), these anti-competitive restrictions by the purchasers of nurses' services were able to limit the rate of increase in nurses' wages.

Finally, if a firm does not face competition in the sale of its product and the firm is non-profit, then the firm does not have to be as concerned with its costs of production (i.e., the wage rates they pay or whether they employ the best people for the job). Examples of this behavior may be found in regulated companies (such as utilities) or in state and local governments. Prior to enactment of prospective payment legislation (DRGs) in 1983, non-profit hospitals were not constrained to produce in cost-minimizing ways. Heavily subsidized medical schools with excess demand for their spaces can also be less efficient.

A firm that is a non-profit or regulated monopolist in the sale of its product can pass on higher wages and the additional costs of hiring less competent personnel. It is precisely in such situations that firms can also practice discrimination in hiring. In a competitive industry, if a firm paid higher wages or hired less competent workers than its competitors, its costs would be higher. The firm could not compete on price and would either be forced to go out of business or to change its employment practices. Discriminatory practices are therefore more likely to occur in industries or among firms that are less concerned with their costs (11).

Theories to Explain Wage Disparities

Women, on average, earn less than men. Some occupations are also filled predominately by women. Why does this occur?

According to the "crowding" theory, women are channeled by either their own expectations or by those of others into certain professions that are predominately female. The exclusion of women from higher-paying male dominated jobs causes a surplus of women within particular jobs, thereby leading to lower wages in the female-dominated jobs. Little evidence, however, exists to support the premise that women's occupations, such as nursing or clerical work, are more crowded than men's occupations. Moreover, for the crowding theory to be a valid explanation of differences in male/female wages, the market would have to be non-competitive in some manner, otherwise some women would enter male-dominated professions to receive a higher rate of return. The mobility between occupations would equalize wages.

The most accepted explanation by economists for wage disparities is based on the theory of human capital (12). There are non-monetary reasons why people select certain jobs; preferences as to the type of work and location may have an influence on a person's employment preferences. Wages reflect these differences in preferences. Second, individuals have different abilities resulting in different incomes. However, an individual's productivity is not fixed; it can be increased with additional training and education. Therefore, wages also differ according to the individ-

ual's investment in education, training, and experience. Thus if females anticipate leaving the work force, they may invest less in education; married women who have undertaken traditional home responsibilities have found this to be an obstacle in making a full commitment to their careers.

How well does the above explain male/female wage differentials? According to empirical studies, most of the differences in male/female wage ratios can be explained by differences in the total number of years of work experience, the years of tenure on the current job, and the pattern or continuity of previous work experience (13). These studies do not deny that discrimination may exist; however, it is not an important determinant of observed wage differences.

As differences in human capital between males and females lessen, so should differences in their wage rates. Career patterns and expectations have changed significantly since the 1960s. For example, in 1970 females represented 9.4 percent of medical school applicants and 8.4 percent of the graduates. In 2001-2002, 48.0 percent of the applicants were female as were 44.1 percent of the graduates. This percentage should continue to increase. As educational levels, work roles, and work expectations of males and females become similar, so should their relative wages.

Determination of Wages Through Comparable Worth

What are the likely consequences if wages were based on comparable worth instead of the marketplace? Consultants and committees would be used to conduct job evaluations on each position within an organization or firm. These evaluations would involve assessment of the relative worth of each position according to skill required, effort involved, working conditions, and level of responsibility. Points would be assessed for each of these factors, and salaries would be determined by the total number of points in each position.

A comparable worth based wage determination system would result in a number of problems. First, the complexity of categorizing people would be tremendous, particularly if one were trying to establish a nationally applicable system affecting tens of

thousands of jobs in hundreds of thousands of places. Further, these job evaluations would have to be updated as tasks and job conditions change. The implementation cost of such a system would be enormous, not only in terms of the time involved but also the cost of hiring the consultants and establishing job evaluation committees. An additional very large cost would result from the resolution of identified pay inequities, which will be in the billions of dollars.

Second, wage equity under comparable worth would not be achieved by lowering wages in job classifications in which job evaluations indicated that certain groups were being overpaid. Individuals in those groups would protest. Instead, occupations in which employees were currently being underpaid would have their wages increased. When the employer is a state government, the state can increase taxes to pay the increased costs; however, if taxpayers or their legislators were unwilling to vote for higher taxes, less money would be available for other programs or the employer would be forced to reduce employment in those occupations where wages were raised. Moreover, it is in female-dominated occupations that wages would be increased and, consequently, where fewer people would be hired. Although those remaining on the job would receive higher wages, some would be let go.

Third, wages determined by a commission would not reflect supply and demand conditions. Visualize a market with shifting demand and/or supply curves. The result would be shortages and surpluses of workers in different occupations and regions. How would these shortages and surpluses be resolved? How will it be possible to increase wages in male-dominated occupations (e.g., firemen) experiencing shortages? Jobs in surplus professions will have to be rationed since the wage would be above the equilibrium level. What criteria will be used for selecting employees when the wage exceeds the equilibrium wage? Rationing provides an opportunity for discrimination, as has previously been the case with medical school admissions.

In summary, while comparable worth may be conceptually appealing to those that distrust the market, its implementation would be costly and unlikely to achieve the goals its proponents desire. Problems that would emerge are politicization of wage

determination, a large bureaucracy for evaluating all positions in the economy, lower levels of employment for women in those occupations in which wages have been increased artificially, increased costs of services and a smaller output in those industries with a greater portion of women, a decreased incentive for women to move into other professions, and no mechanism for eliminating shortages and surpluses.

Alternative Strategies for Increasing Wages

Alternative strategies should be pursued to achieve greater pay equity. The first is the enforcement of current laws against discrimination; females desiring to enter male-dominated professions should be able to do so. A shift in the number of females from female-dominated professions to male-dominated professions would increase the wage in the former and depress wages in male-dominated professions. Differences in wages would more closely reflect either preferences for some types of occupations or differences in investment in human capital.

Next should be the elimination of the many restrictions that prevent labor markets from operating competitively. Legal restrictions that prohibit trained professionals from undertaking tasks even though they are qualified to perform them result in higher prices to society and in lower wages to those who are prohibited from performing them. For example, a nurse could receive increased income as a nurse-midwife. However, when an insurance company refuses to provide malpractice coverage to obstetricians working with the nurse-midwives or if an insurer refuses to pay the nurse-midwife unless the bill is submitted by a physician, access by patients to nurse-midwifery services is limited and nurses are prevented from increasing their incomes. In many instances, restrictive nurse practice acts unnecessarily limit the nurse's ability to perform certain functions.

Competition in the delivery of health services is beneficial to the career goals of nurses. Managed care organizations must be price competitive if they are to survive and grow. The managers of such organizations are more willing to look for less expensive methods of providing services, more willing to innovate, more responsive to patient concerns, and less bound

to traditional tasks and roles than were not-for-profit hospitals reimbursed on a cost basis and state medical societies concerned with protecting their members' incomes. In a price-competitive system, nurses are moving into such new areas as utilization review, case management for catastrophic care, and home health services, and are performing additional tasks previously denied them.

The marketplace does not place the same value on certain workers or services as some would prefer. However, years of experience with trying to regulate the market through wage and price controls have demonstrated that it is costly and eventually ineffective to try to do so. Alternatively, to increase nurses' wages the market's criteria for wage determination must be understood and relied upon. Enforcing current laws on discrimination, removing economic restrictions, and providing access to educational and training opportunities would increase job opportunities and incomes for women while benefiting society through increased availability of services.

SUMMARY

In the late 1940s, the nursing market appeared to have been in equilibrium. However, up until the mid 1960s there was a shortage; the demand for nurses by hospitals exceeded the supply of nurses at the market wage. Based upon an analysis of relative wages of hospital-employed nurses relative to other nurses, it appeared that a static shortage was created by hospitals colluding to prevent nurses' wages from rising. In an attempt to limit the increase in their nursing costs and a belief that increased wages would not increase the number of employed nurses, hospitals instead intensified their recruiting of foreign-trained nurses and substituted nurses aides for RNs. Hospitals also lobbied for federal subsidies to increase the supply of nurses.

The static shortage disappeared after Medicare and Medicaid were enacted. As the demand for hospital care (and the consequent demand for nurses) increased, hospitals were able to pass on to the government the increased costs of higher wages and the

increased number of nurses. Nurses' wages in the post-Medicare period increased rapidly, as did nurse participation rates. In both the short and long run, nurses' employment and career decisions were more responsive to higher wages than hospitals believed. The high rate of return to nursing led to increased enrollments in associate degree programs. The rate of return to nursing again became comparable to other occupations. (The rate of return varied, however, depending upon the type of degree received by the nurse.)

Federal legislation to support nurse training started in 1964 and continued for many years. The original manpower goals underlying the 1964 Nurse Training Act were achieved, although they would have been achieved without the federal subsidy program. In fact, had the federal subsidy program been very successful in increasing the number of nurse graduates, the increased supply of nurses would have led to a lower rate of increase in nurse wages, hence a smaller increase in the nurse participation rate.

Reliance on market mechanisms rather than on federal subsidies to solve nurse shortages is likely to bring about a quicker resolution of that shortage. First, future demand increases for nurses can be met by increasing the number of hours that part-time nurses work. Almost 30 percent of all employed nurses (more than 625,000) work part time. Increased wages that induce these nurses to increase their hours of work can result in large increases in the supply of nursing time. Second, higher wages for nurses will cause hospitals and other demanders of nurses to re-think how they use their nurses. As nurses become more expensive to employ, hospitals use nurses in higher-skilled tasks and delegate to lesser-trained nursing personnel, such as licensed practical nurses, certain housekeeping and other tasks currently performed by registered nurses (a significant percentage of nurses' time is spent on tasks that can be delegated to others). Third, higher wages and new roles for nurses make nursing a more attractive profession. Lastly, nursing has been a female profession. There is no reason why more males (6 percent of all RNs) and minorities (14 percent of all RNs) cannot be attracted to a nursing career. Higher wages (annual average earnings of registered nurses employed full time were

\$46,782 as of 2000) and new nursing roles will increase the attractiveness of nursing to a larger segment of the population.

No economic justification for the government to subsidize nurse education exists. If RNs desire to undertake additional roles and responsibilities, it is not the government's role to subsidize their education to enable them to achieve their objectives any more than for any other professional group. Revision of state practice acts to permit nurses to undertake additional tasks for which they are trained and qualified to perform will result in an increased return from doing these tasks, which would justify increased investment by nurses for this training. Eliminating anti-competitive restrictions is a more appropriate policy. The goals used by the nursing profession to justify subsidies to nursing education should be explicit so that it can be determined whether it is a goal agreed to by the rest of society and whether the proposed approach is the least expensive way to achieve it.

Recurrent claims of a shortage of nurses have been temporary or dynamic and have been resolved through market forces without government intervention.

Nurse associations have sought various types of legislation to increase the roles, responsibilities, and incomes of nurses. These legislative remedies have included federal subsidies to nursing schools, comparable worth for setting nurse wages, minimum nurse staffing ratios in hospitals and other care settings, as well as efforts to prevent the merger and closure of hospitals.

Nurse aspirations of greater responsibilities and independence, along with higher incomes, are, however, more likely to be achieved in a competitive market than through government regulation. In their search for lower costs and increased quality in a competitive environment, managed care organizations and group practices are less bound by traditional dividing lines between nurses and physicians. The demand for different types of nurse education will be market driven, determined by the types of roles nurses will be engaged in, such as caring for more severely ill patients, greater responsibilities in primary care settings, as well as increased managerial responsibilities in managed care organizations.

APPENDIX: MARKET STRUCTURE AND NURSE WAGES AND EMPLOYMENT

The earlier discussion on RN shortages was based on either hospital collusion (static shortage) or information lags on the part of both hospitals and RNs that demand and supply conditions had changed (dynamic shortages). Separate from the above types of shortage, a shortage of RNs can occur because hospitals are monopsonists or oligopsonists in their demand for registered nurses. In monopsony or oligopsony markets, high vacancy rates will persist, and hospitals will not be able to hire all of the nurses they want at the going wage rate, *even though the market is in equilibrium*.

For the RN market to be characterized by monopsony or oligopsony there is only one or just a few hospitals hiring RNs. As the major demanders of RNs in a market, the hospital faces a rising (less elastic) supply curve for RNs. (For other types of labor, such as computer programmers, hospitals may represent a small portion of the total demand for such personnel, therefore the hospital faces a more elastic supply curve.) Non-hospital settings (physician offices, outpatient clinics, etc.) employing RNs are small purchasers of RNs. These firms face a much more elastic supply curve for RNs, and RNs represent a small portion of their total cost. These employers would therefore be able to hire all the RNs they want at or slightly above the prevailing wage.

Further, when nurses have limited mobility, the nurse supply curve will be less elastic, otherwise they would move to those markets where wages are highest and nurse labor supply curves would be more elastic. Particularly in previous times, diploma school graduates, married nurses who considered themselves secondary wage earners, and nurses with young children who preferred to work part time were likely to be less mobile.

Thus monopsony and oligopsony market structure is an additional explanation of the existence of nurse vacancy rates and why hospitals claimed there was a shortage of nurses. Hospitals will demand more RNs than will be supplied at the going wage rate. Hospitals will therefore report RN vacancies and claim there is a shortage.

Monopsony also results in lower wages and employment of RNs compared to a competitive market. (If input supply curves were elastic to hospitals, then hospitals would be able to hire all the RNs demanded at the going RN wage; hospitals would not report vacancies nor claim a shortage of RNs exist. The difference between a monopsonist and a competitive hospital when both face an elastic RN supply curve is that the monopsonist would hire fewer RNs because the monopsonist's demand for RNs would be its marginal revenue product curve.)

The following discussion explains why a monopsonist reports vacancies and claims there is a shortage when an equilibrium situation exists.

A monopsonist, with a demand curve D_1 , will face a rising supply curve for nurses described by S_1 in Figure 16-7. The hospital will have to raise the wage rate to hire an additional nurse; however the monopsonist cannot pay a higher wage just to that additional nurse. It must pay the same, higher, wage to all of its currently employed nurses. Thus the cost of hiring an additional nurse is not just the wage that nurse re-

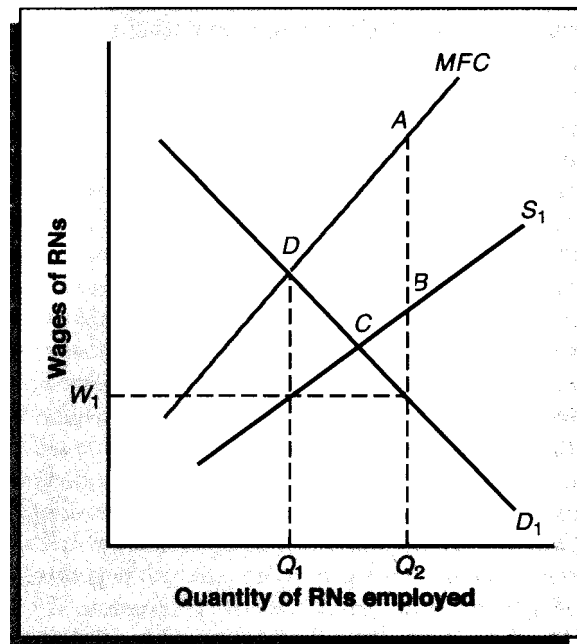


Figure 16-7. An illustration of a monopsonistic market for registered nurses.

ceives but also the wage increase that all currently employed nurses receive. Thus the monopsonist faces a marginal factor cost (MFC) curve that lies above the supply curve. The MFC curve represents the cost to the monopsonist of hiring an additional nurse. At each point on the supply curve, the MFC curve indicates the additional cost in terms of higher wages that must be paid to all nurses hired previously. Thus the equilibrium quantity of nurses the firm will hire and the wage it will pay under such circumstances are given by the intersection of the demand curve and the MFC curve. Drawing a line down to the supply curve will indicate the wage the firm would pay and the quantity of RNs employed.

At the equilibrium wage, W_1 , the monopsonist would be willing to hire Q_2 quantity of nurses, which is the intersection of the wage and the firm's demand curve. However, if the firm were actually to hire Q_2 number of RNs, it would have to pay a wage much higher than W_1 to attract them. The new wage would be at that point on the supply curve above Q_2 shown by B. The cost to the firm of that wage and Q_2 number of nurses would be Point A on the MFC curve. Since Point A on the MFC curve exceeds the firm's demand, the firm would not want to hire Q_2 nurses at a wage represented by Point B on the supply curve. Thus W_1 and Q_1 are equilibrium points for the monopsonist. However, at that wage, W_1 , the firm will report $Q_1 - Q_2$ vacancies for nurses. These are the number of nurses it would be willing to hire at wage W_1 .

Vacancies are thus expected and are consistent with an equilibrium position in a monopsony situation, even though the hospital will claim it faces a shortage of nurses.

The effect of unionization in a market dominated by a monopsonist will be to eliminate the monopsonist's "shortage," since a prevailing wage will be established whereby the hospital could hire all the nurses demanded at that wage. The vacancy rate should decrease. Hospital monopsony power over nurses' wages is weakened by the growth (both actual and expected) of a nurse's union.

For example, if a union were formed and set a minimum (prevailing) wage for its employees, the supply curve for nurses would change. It would become horizontal up to the point of the minimum wage on the

original **supply** curve. This would indicate that under the collective bargaining agreement, nurses could not be paid below a certain minimum union wage. The hospital can hire all the nurses it wants at that wage. The MFC curve would also change. It would become equal to the new minimum wage since there is no additional cost to the hospital as it hires an additional nurse; that is, it does not have to increase the wages of those nurses currently employed. Up to the point where the negotiated wage intersects the original supply curve, the hospital can hire all the nurses it wants at the negotiated wage. Beyond that point the hospital will again face a rising supply curve and a rising MFC curve; the hospital will have to increase its wages and also pay higher wages to its existing nurses.

In situations involving a monopsony purchaser and a union representing the employees, it is possible for the union to set a wage that is higher than the previous wage and also increases employment (see Figure 16-8). If the union sets a wage rate anywhere between A and B, it will raise the wage (since the current wage is W_1),

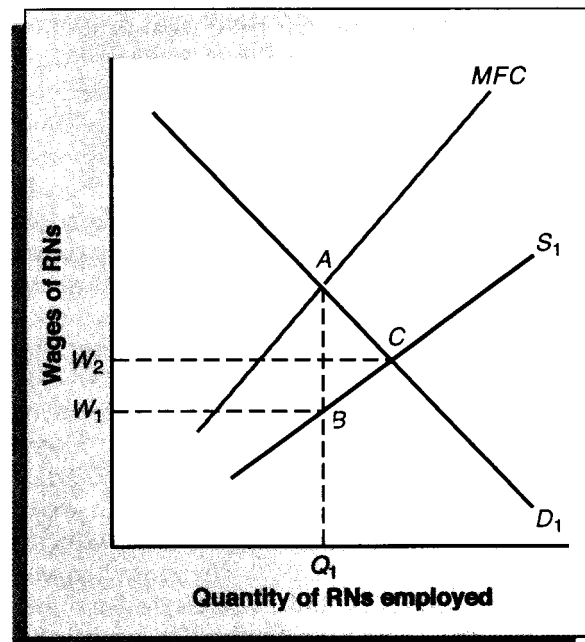


Figure 16-8. Collective bargaining and a monopsony market for registered nurses.

and it will increase the number of nurses hired. Any wage between A and B will make the supply curve and the MFC curve horizontal up to that point. For example, a wage rate of W_2 is the point where employment of RNs is greatest. The new wage rate intersects the demand curve at the same point that the supply curve does. Therefore the wage rate (W_2) is the new MFC and supply curve up to the point where it intersects the original supply curve. To hire more nurses after that point, the firm will have to pay a higher wage and thus face a rising MFC and rising supply curve.

Point A on the demand curve is the highest union wage that can be set without decreasing employment of RNs.

With a union, nurse wages should increase and possibly employment. Whether or not increased employment will occur will depend on the union's objectives. If the union seeks to maximize wages for current union members, then there will be no increased employment of RNs.

Registered nurses employed in non-profit hospitals were expressly exempt from the legal provisions of the National Labor Relations Act between 1947 and 1974 and therefore did not have legal protection of their rights to organize or support a union. Hospitals were under no obligation to engage in collective bargaining with their employees. (In 1974, an amendment to the Taft-Hartley Act repealed hospitals' exempt status.) Collective bargaining on behalf of hospital nurses therefore started slowly. In addition to the impediments to collective bargaining contracts that legally permitted hospitals to refuse to bargain with unions representing hospital employees, the American Nurses' Association (ANA) had not been a strong proponent of unionization.

In 1970, approximately 38,000 RNs were included under collective bargaining agreements, representing about 5 percent of employed RNs. By 1977, 200,000 RNs (more than 20 percent of employed nurses) were included under collective bargaining agreements, a substantial increase over 1970. The growth in unionization has lagged behind the increased number of RNs, in 2000 representing only 19 percent of employed RNs (14).

The effects of collective bargaining agreements, however, are felt beyond the numbers of nurses cov-

ered. To forestall such agreements, hospitals are likely to offer higher wages to RNs.

A number of studies have attempted to estimate the degree of monopsony (or oligopsony) power in nurse labor markets (15). These studies generally found evidence supporting hospitals' monopsony power. It is likely that monopsony power was more prevalent in earlier periods. A greater percentage of nurses graduated from diploma schools and were more closely tied to the hospitals where they were trained. Also many nurses who were married and who had families considered themselves to be secondary wage earners and were therefore less mobile.

The increased number of hospital mergers and consolidation that has been occurring increase hospitals' monopsony power and can result in lower RN wages and employment. RNs should therefore favor the application of anti-trust laws to hospital mergers.

REVIEW QUESTIONS

1. Various measures have been used to indicate that there has been a shortage of nurses. Evaluate the use of such measures to indicate the existence of a shortage. Second, what information would you use to indicate whether or not a shortage exists? Third, distinguish between a dynamic and a static shortage.
2. Contrast the market for registered nurses during the periods before and after Medicare. How well did the market for hospital-employed nurses perform in each of these two periods?
3. How have the last several shortages of nurses been resolved? How does an increase in nurse wages affect both hospitals' demand for nurses and the supply of nurses?
4. Why was the shortage of nurses that occurred before Medicare different from subsequent shortages?
5. Contrast the following two approaches for eliminating the shortage of nurses:
 - a. Federal subsidies to nursing schools.
 - b. Providing information on nurse demand and supply to prospective nursing students

and to demanders of nursing services, such as hospitals.

6. Nurses are restricted in the tasks they are permitted to perform. Also, certain nurse specialties (e.g., nurse-midwives) would like to bill for their services on a fee-for-service basis rather than work for obstetricians. Using the theory of the demand for labor, explain how changes in each of the above would affect the demand for registered nurses.
7. You are an economic consultant to the American Nurses' Association. What would you expect the effects of changes in the healthcare markets, such as prospective payment for hospitals, growth in HMOs, the increased supply of physicians, and so on, to be on the employment and earnings of RNs? In your answer, trace through the effects you expect on both the product and factor markets.
8. "Comparable worth" proponents seek equal pay for work of comparable value. What are the consequences of setting nurses' wages according to the concept of comparable worth? Describe the factors that determine wages in a competitive market (including those factors that cause shifts in the demand for labor). What are noncompetitive situations that have resulted in lower nurses' wages?
9. Nursing associations have proposed increasing the educational requirements to a 4-year B.S. degree for all persons desiring to become professional nurses. What are the economic consequences of instituting such a change? Who would be expected to favor it, and who would be expected to oppose it?
10. How would unionization in a monopsony market for nurses' services increase both nurses' wages and hospital employment?

REFERENCES

1. The discussion of the RN market in the period before and after the start of Medicare and Medicaid is based on Donald E. Yett, *An Economic Analysis of the Nurse Shortage*, (Lexington, Mass: D.C. Heath, 1975).